Early detected vascular complication following femoral artery puncture for endovascular SFA revascularisation. Case report

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ABBREVIATIONS
SFA - superficial femoral artery
RSFA - right superficial femoral artery
PFA - profund femoral artery
Angio-CT - Computer Tomography Angiogram
MRI - Magnetic Resonance

ABSTRACT

Iatrogenic vascular trauma is more frequent today as a result of the increase in diagnostic and therapeutic femoral catheterizations. We present a case of iatrogenic profund femoral artery injury following standard ipsilateral access to SFA revascularisation. 57 years old man was treated due to RSFA total occlusion (TASC C). First puncture was unsuccessful and catheter was placed in PFA. Next attempt was successful and standard angioplasty and stenting of the RSFA were performed. Next day severe haematoma of the thigh was observed. Angio-CT revealed injury with huge false aneurysm from the first branch of PFA. After few days using contralateral approach few coils were implanted in the beginning of the injured arterial branch. Aneurysm was successfully cured (six months follow up).
CASE REPORT

57 years old man was admitted to our department due to the symptomatic chronic limb ischemia (grade 3 according Rutheford classification). Angio-CT confirmed 20 cm long occlusion in the middle part of RSFA (TASC C). We decided to perform endovascular intervention using ipsilateral approach. The right femoral artery was punctured and standard short wire compatible and packed with 6F introducer (Boston Scientific) was applied. Control X-ray scan revealed that wire was located in right profound femoral artery. We removed the wire, next puncture was successfully located in RSFA. We performed standard angioplasty (balloon 5x150 Mustang, Boston Scientific) and stenting (self-expanding stent 6x100 Epic, Boston Scientific) of the RSFA with a very good arteriography and clinical result.

After 24 hours sudden thigh pain was appeared. On examination, the patient appeared healthy. He had a pulse rate 90/min and BP 130/80. He had a normal prothrombin time and APTT. Patient presented a tens swelling of the right thigh. Ultrasonography and angio-CT revealed huge pseudoaneurysm and haematoma originated from first branch of the profound femoral artery.

First few days we treated the patient conservatively but without success. He needs a transfusion of 2 concentrated blood units. (Figure 1,2)

Finally we decided about intervention. The left femoral artery was punctured and 6F introducer sheat (Boston Scientific, US) a 0.035 inch hydrophilic guide wire (Terumo, Japan) was passed through it. Next, a 6F pigtail angiography catheter was placed into the abdominal aorta. Under road-map guidance using RDC catheter (Boston Scientific) right common femoral artery was reached by guide wire. Follow the guide wire Bern catheter (Boston Scientific) was applied. Control angiography was made. (Figure 3) Aneurysm was easily localised and three 5 mm coils (Cook) were administrated in the origin of first branch of profound femoral artery. Primary only injured collateral was thrombosed (Figure 4), but secondary we observed total branch occlusion (Figure 5).

Post intervention ultrasound and Doppler examination showed complete closure of pseudoaneurysm.

After intervention we saw haematoma absorption. Patient was discharged few days after intervention.

Control after six months revealed hypotrophy of adductor longus muscle. Patient needed intensive physiotherapy.

DISCUSSION

Based on literature, most of the iatrogenic vascular injuries occurring during endovascular procedures, femoral vein catheterisation and hip arthroplasty. Penetrating trauma of the vessel wall can lead to damage of the arterial wall with formation of a pseudoaneurysm. The diagnosis can be made according physical examination (haematoma, pain, tens and swallow leg).

Color doppler sonography seems to be first step diagnostic mode with a good specificity and sensitivity (1). Sometimes ultrasound-guided compression may solve a problem (2). CT and MRI still play a essential role. Sometimes conventional angiography is still required to plan endovascular or surgical treatment (3)

The success of surgical repair of iatrogenic femoral artery lesions is high. However, it may be complicated by several factors, such as anatomical accessibility if the vascular lesion lies deep or high risk or synthetic graft infection risk in contaminated haematoma.

Recent improvements in endovascular techniques starting from direct thrombin (or autologous blood) injection ending on metallic coils and covered stent implantation have given effective alternatives to surgical treatment (4-6). The method choice is strictly relative to pseudoaneurysm neck. When the neck is narrow coils may be successfully used. If not cover stent implantation seems to be favourable. (7) There are some limitations to endovascular procedures including costs or difficult anatomy. As we has shown above the covering of even small branch of deep femoral artery may influence for quality of life.

We still don’t have long-term studies comparing different management methods of femoral artery iatrogenic injury.

CONCLUSION

Our patients history shows that endovascular treatment of injured femoral artery may be safe and effective.

FIGURES

Fig. 1 Hudge thigh haematoma (lateral aspect)
Fig. 2 Hudge thigh haematoma (frontal aspect)
Fig. 3 Digital Subtraction Angiogram of right deep femoral artery. Visible aneurysm.
Fig. 4 Digital Subtraction Angiogram of right deep femoral artery. First visualisation after coils implantation. Only injured branch is thrombosed.
Fig. 5 Digital Subtraction Angiogram of right deep femoral artery. Few minutes after coils implantation. One of the main branch of right deep femoral artery is thrombosed.
FIG. 4  Digital Subtraction Angiogram of right deep femoral artery. First visualisation after coils implantation. Only injured branch is thrombosed.

FIG. 5  Digital Subtraction Angiogram of right deep femoral artery. Few minutes after coils implantation. One of the main branch of right deep femoral artery is thrombosed.

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